Adobe Creek Upper Reach 5 Restoration Project
Year 10 (2018) Mitigation Monitoring Report

Prepared by:

Laura Garrison, Biologist
Santa Clara Valley Water District

December 20, 2018

Executive Summary

Permit Numbers

United States Army Corps of Engineers (USACE): 2007-00793S
California Department of Fish and Wildlife (CDFW): 1600-2007-0452-3
San Francisco Bay Regional Water Quality Control Board (RWQCB): File No: 2188.07 (PFA),
Site No. 02-43-C0562

Background

The Santa Clara Valley Water District (SCVWD) Adobe Creek Upper Reach 5 Restoration Project (project) begins at West Edith Avenue and extends downstream for a total length of approximately 1,100 linear feet in the City of Los Altos and Town of Los Altos Hills. The development of the project resulted from mitigation requirements set forth in the project's Final Supplemental Environmental Impact Report (SCVWD 2007) and environmental permits listed above. The project design was modified from that proposed in the larger, 16-reach, capital improvement project described in the Adobe Creek Final Environmental Impact Report (SCVWD 1999).

The purpose of the project is to improve the geomorphology of the Adobe Creek channel, repair the banks and channel bottom, and restore native riparian habitat (EDAW 2007). These improvements were achieved by replacing existing and failing hardscape and the concrete channel bottom with a bioengineered channel that incorporates earthen banks wherever possible, boulders, and planted native riparian vegetation. The project's Mitigation and Monitoring Plan (MMP) describes the habitat mitigation and monitoring requirements (EDAW 2007). The following report contains the vegetation monitoring results for Year 10 of the 10-year monitoring period and addresses the success criteria specified in the MMP.

Results

The average percent cover for native trees, shrubs, and ground cover was approximately 70%, 31%, and 43% respectively in Year 10. The Year 10 percent cover performance criteria are 50% cover by native trees, 20% cover by native shrubs, and 50% by native ground cover (EDAW 2007). Year 10 tree cover and shrub cover exceeded their respective Year 10 percent cover performance criteria. Ground cover, at 43% native cover, did not achieve the Year 10 percent cover performance criterion of 50%. However, it is requested that excess tree and/or shrub cover be applied to the ground cover deficit (-7%). There is an excess of 20% tree cover and an excess of 11% shrub cover (combined native tree and shrub cover +31%), either of which brings groundcover above the 50% mark. Biologically, site conditions are such that it makes sense to use excess shrub cover to compensate for lack of ground cover, because in many places the shrub layer is dense from ground level to knee or waist height, performing the habitat functions of both shrub and ground cover strata.

The Year 10 average overall health and vigor of the mitigation plants was 3.2 out of 4.0 (good). Additionally, observations of high levels of natural recruitment for multiple native species indicate that the site is on a trajectory towards self-sustainability.

Agency Actions

The SCVWD requests written verification from the resource agencies confirming that the required compensatory mitigation is fulfilled based on demonstrated mitigation success and no further annual reporting is required. The Year 10 monitoring results and completion of past monitoring commitments show the Adobe Creek Upper Reach 5 mitigation requirements are met with creek channel, wetland, and riparian habitat successfully established. As required by the RWQCB Water Quality Certification, the project was added to Wetland Tracker, now EcoAtlas Project Tracker, and updated in July 2018 (see https://www.ecoatlas.org/regions/ecoregion/statewide/projects/1395).

With project construction completed in 2008, final post-construction channel conditions in Reach 5 of Adobe Creek were reported in Year 5 (SCVWD 2014). Wetland habitat monitoring was conducted in Years 2 through 5 and the final wetland success criteria were met in Year 5 (0.053 acres of wetland restored) with results submitted to the resource agencies (SCVWD 2013).

Approximately 0.76 acres of native riparian forest has successfully been established. There were 25 oak trees planted and 11 coast live oaks (*Quercus agrifolia*) naturally recruited within the riparian mitigation site. In addition to oaks, more than 290 native riparian trees from eight different species were planted. Almost 530 native shrubs and vines, and over 170 creeping wildrye (*Elymus triticoides*) grasses were also planted. Over 200 more native riparian plants were installed in 2010. Survival of the planted trees and shrubs was monitored Year 1 followed by measuring health and vigor, and percent cover per the MMP. Year 10 results for percent cover of native riparian tree, shrub, and ground cover, as well as plant health and vigor are shown above, and detailed in this report. The mitigation site experienced abundant natural recruitment of native flora.

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Section 1.0 Introduction

1.1 Permit Numbers

United States Army Corps of Engineers (USACE): 2007-00793S
California Department of Fish and Wildlife (CDFW): 1600-2007-0452-3
San Francisco Bay Regional Water Quality Control Board (RWQCB): File No: 2188.07 (PFA),
Site No. 02-43-C0562

1.2 Project Location and Overview

The Santa Clara Valley Water District (SCVWD) Adobe Creek Upper Reach 5 Restoration Project (project) begins at West Edith Avenue and extends downstream for a total length of approximately 1,100 linear feet in the City of Los Altos and Town of Los Altos Hills (see Figures 1 and 2). The Upper Reach 5 segment of Adobe Creek is a segment of the larger Reach 5, which also begins just upstream of West Edith Avenue but extends downstream to Foothill Expressway. The development of the project resulted from mitigation requirements set forth in the project's Final Supplemental Environmental Impact Report (SCVWD 2007) and environmental permits listed above. The project design was modified from that proposed in the larger, 16-reach, capital improvement project described in the Adobe Creek Final Environmental Impact Report (SCVWD 1999).

The Adobe Creek Upper Reach 5 Restoration Project's Riparian Mitigation Monitoring Plan (MMP) outlines the anticipated impacts on biological resources occurring on the site and the onsite mitigation and monitoring measures proposed as compensation (EDAW 2007). The MMP established the habitat mitigation requirements to compensate for impacts to USACE, CDFW, and RWQCB jurisdictional areas.

1.3 Project Description

The purpose of the project is to improve the Adobe Creek channel, repair the banks and channel bottom, and restore native riparian habitat (EDAW 2007). Project construction in 2008 resulted in substantial improvements to the habitat structure and functions of this section of Adobe Creek. These improvements include repairing and stabilizing eroded banks, removing accumulated sediment under the West Edith Avenue Bridge, improving channel conveyance and overland flow capacities, and removing barriers that inhibit native fish passage; all while minimizing or avoiding environmental and right-of-way impacts related to the project. Final post-construction channel conditions in Reach 5 of Adobe Creek were reported in Year 5 (SCVWD 2014). Installation of 0.76 acre (ac) of native riparian trees, shrubs, and flood tolerant plants appropriate for Adobe Creek was completed in 2008.

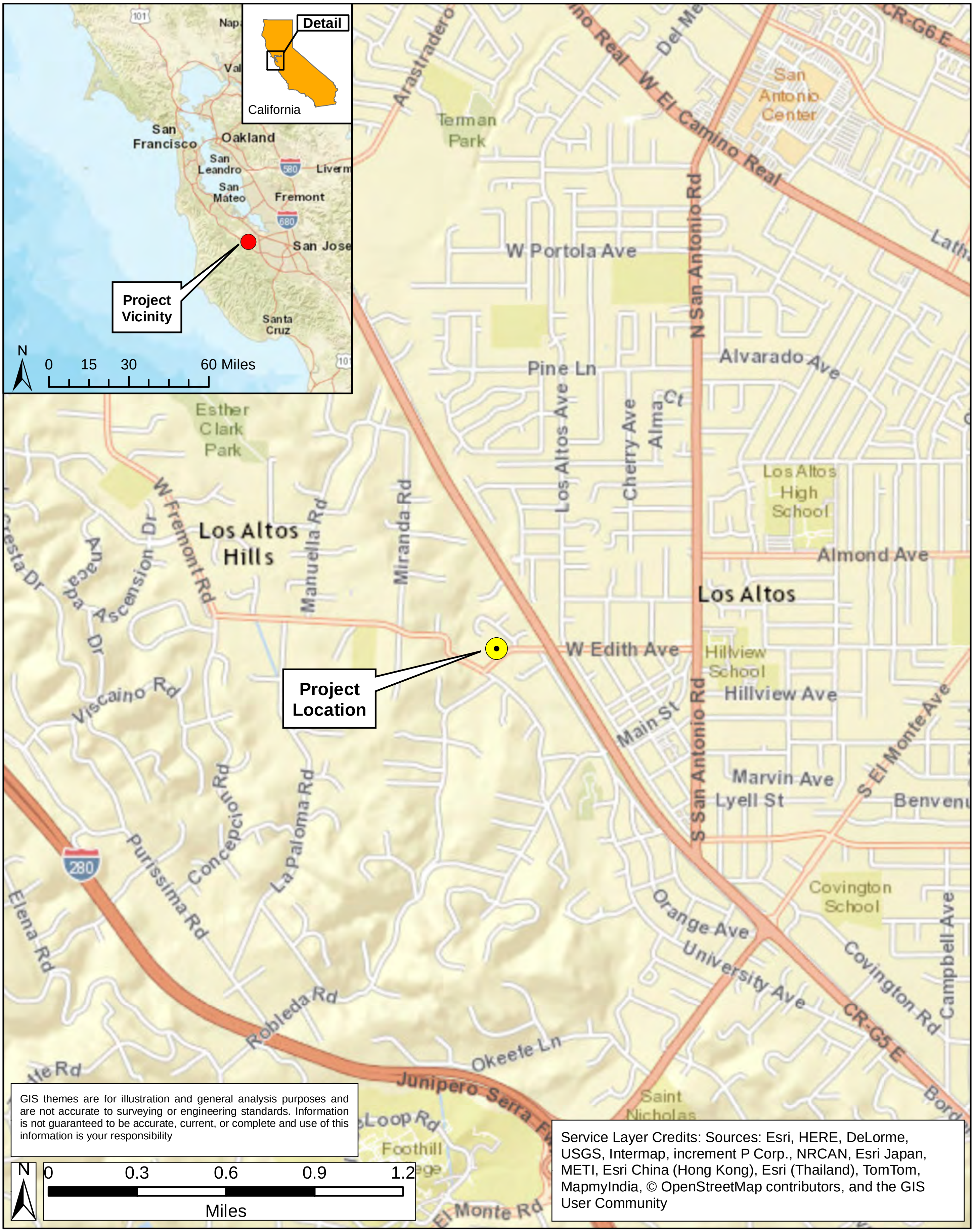

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Figure 1: Vicinity Map

Adobe Creek, Upper Reach 5 Restoration Project
Year 10 Mitigation Monitoring Report
December 2018

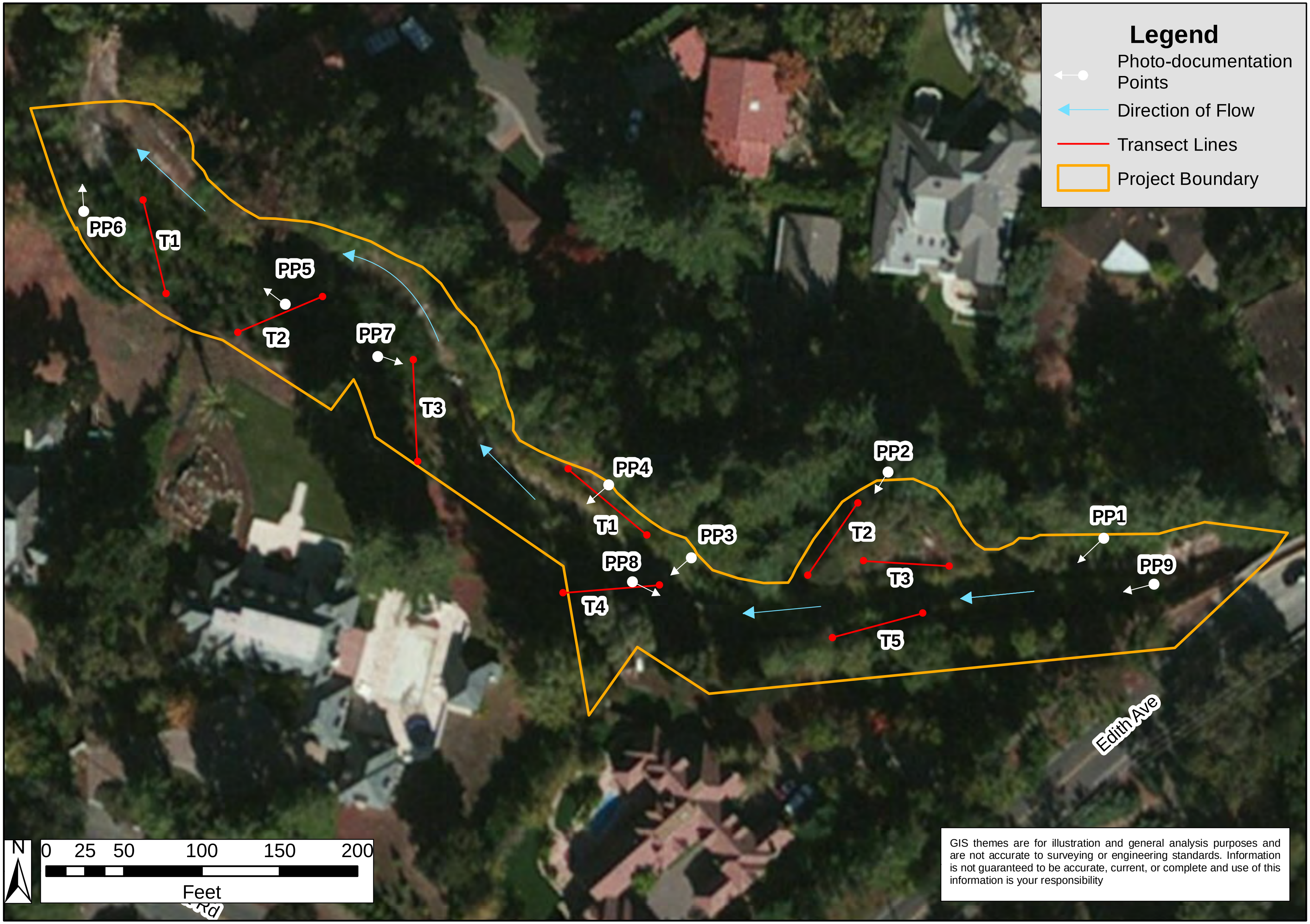

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Figure 2: Mitigation Site Map

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Table 1 summarizes the total number of plantings installed at the 0.76-ac mitigation site in 2008 and 2010.

Table 1. Total Quantity of Native Plants Installed in 2008 and 2010

Scientific Name	Common Name	Number of Plants Installed in 2008	Number of Replants in 2010
Acer macrophyllum	big leaf maple	8	
Aesculus californica	California buckeye	7	
Alnus rubra	red alder	8	
Baccharis pilularis	coyote brush	9	
Ceanothus thyrsiflorus	blue blossom	111	4
Cercis occidentalis	western redbud	2	
Clematis ligusticifolia	western virgin's bower	19	
Cornus glabrata	brown dogwood	37	50
Cornus sericea	western dogwood	46	108
Elymus triticoides	creeping wildrye	173	15
Frangula californica	coffeeberry	30	
Heteromeles arbutifolia	toyon	70	2
Lepechinia calycina	pitcher sage	15	
Lonicera hispadula	twinberry honeysuckle	16	
Platanus racemosa	California sycamore	10	
Prunus ilicifolia	holly-leaf cherry	9	
Quercus agrifolia	coast live oak	21	
Quercus lobata	valley oak	4	
Ribes aureum	golden currant	26	8
Ribes sanguineum	red flowering currant	35	
Rosa californica	California rose	13	
Rosa gymnocarpa	wood rose	26	
Rubus ursinus	California blackberry	27	
Salix gooddingii	Goodding's willow	45	Willows (*Salix* spp.) 25
Salix laevigata	red willow	96	
Salix lasiolepis	arroyo willow	108	
Sambucus nigra ssp. *caerulea*	blue elderberry	7	
Symphoricarpos albus	snowberry	15	
Symphoricarpos mollis	creeping snowberry	20	
Vitis californica	California grape	4	
	Total	**1017**	**212**

The MMP presents the project's required performance criteria and monitoring, and states that the site will be monitored during the growing season for a minimum of 10 years after plant installation (EDAW 2007). Monitoring is required to be conducted annually through Year 6 and then once each in Years 8 and 10. Survival of the planted trees and shrubs was monitored Year 1 followed by measuring health and vigor, and percent cover per the MMP. Wetland habitat monitoring was conducted in Years 2 through 5 and the final wetland success criteria were met in Year 5 (SCVWD 2013). The following report contains the results of Year 10 monitoring and addresses the success criteria specified in the MMP.

Section 2.0 Methods

Biologists from SCVWD, Laura Garrison and Zooey Diggory, surveyed the site on September 6, 2018 to quantify Year 10 percent cover by vegetation layer, plant health and vigor, and natural recruitment. Monitoring and data analysis were conducted in accordance with the project's MMP to allow a comparison of the measured vegetation response variables to the MMP's performance and final success criteria. All plant scientific nomenclature follows the Jepson Manual 2nd edition (Baldwin *et al.* 2012).

2.1 Percent Cover

The line-intercept method was used to measure cover along each of the eight randomly positioned permanent transects shown in Figure 2. The lengths of all native vegetation that intercepted the line were recorded (Bonham 1989) by species and lifeform (*i.e.*, tree, shrub, and ground cover). Percent cover was calculated for native trees, shrubs, and ground cover (*i.e.*, herbaceous and prostrate shrub species). When species comprising the ground cover layer were unidentifiable, they were assumed to be native.

2.2 Health and Vigor

A quantitative assessment of health and vigor was conducted for each woody plant that occurred within a 20-foot (ft) radius that originated at a randomly selected point along each transect, per the MMP. The health and vigor of each plant was determined by considering factors such as internode length, leaf color, and leaf size, as well as presence of browse damage, disease symptoms, and insect infestation using the numeric and qualitative scale shown in Table 2.

Numerical ratings were assigned for the foliage, wood, and root crown of each plant. An overall health and vigor score was obtained for each plant by taking the average of the three individual scores. Average health and vigor was calculated by species.

Table 2. Health and Vigor Rating Scale

Health and Vigor Class	Numeric Rating	Criteria
Dead	0	
Poor	1	>75% of plant affected by browse damage, disease, or insect infestation; and/or plant has very short internode lengths and few leaves show healthy color and size
Fair	2	25-75% of plant affected by browse damage, disease, or insect infestation; and/or plant has short internode lengths and some leaves show healthy color and size
Good	3	5-25% of plant affected by browse damage, disease, or insect infestation; and/or plant has medium to long internode lengths and most leaves show healthy color and size
Excellent	4	<5% of plant affected by browse damage, disease, or insect infestation; and/or plant has relatively long internode lengths and most or all leaves show healthy color and size

2.3 Natural Recruitment

Natural recruitment of native woody species was assessed by counting each recruiting individual that occurred within a 5-ft wide band along each transect. When recruits of particular species were too abundant to count, it was noted that many individuals were present. Natural recruits were distinguished from originally installed plants by their lack of planting basins, relatively small stature, and/or clustered spatial distribution.

2.4 Photo-documentation

Photographs of the mitigation site were taken from nine fixed photo-documentation points on September 6, 2018 to track the development of the mitigation site over time. The photo-documentation point locations are indicated on Figure 2.

Section 3.0 Results and Discussion

3.1 Percent Cover

The average percent cover for native trees increased from approximately 37% in Year 6 to 70% in Year 10 (Table 3). The average percent cover for native shrubs increased from approximately 26% in Year 6 to 31% in Year 10. The average percent of ground cover increased from approximately 38% in Year 6 to 43% in Year 10.

The Year 10 percent cover performance criteria are 50% cover by native trees, 20% cover by native shrubs, and 50% by native ground cover (EDAW 2007). Year 10 tree cover and shrub cover exceeded their respective Year 10 percent cover performance criteria. Ground cover, at 43% native cover, did not achieve the Year 10 percent cover performance criterion of 50%. However, it is requested that excess tree and/or shrub cover be applied to the groundcover deficit. There is an excess of 20% tree cover plus 11% shrub cover (+31% excess combined cover), either of which would bring ground cover well above the 50% mark. Biologically speaking, the site conditions are such that it makes sense to use excess shrub cover to compensate for lack of ground cover, because in many places the shrub layer is dense from ground level to knee or waist height, performing the functions of both shrub and ground cover strata.

Table 3. Percent Cover by Trees, Shrubs, and Ground Vegetation in Years 6, 8, and 10

		% Tree Cover			% Shrub Cover			% Ground Cover		
Bank	**Transect**	**Yr-6**	**Yr-8**	**Yr-10**	**Yr-6**	**Yr-8**	**Yr-10**	**Yr-6**	**Yr-8**	**Yr-10**
North	1	13.8%	32.4%	100%	0.0%	2.9%	4.9%	100%	43.1%	34.3%
	2	0.0%	0.0%	34.0%	0.0%	0.0%	0.0%	0.0%	5.9%	2.0%
	3	6.0%	3.9%	46.9%	5.0%	13.7%	16.7%	100%	54.9%	8.3%
South	1	50.0%	75.0%	100%	100%	56.0%	68.0%	11.7%	54.0%	86.0%
	2	45.5%	86.8%	100%	37.3%	27.2%	48.0%	20.0%	14.0%	33.0%
	3	36.4%	66.7%	84.0%	51.5%	68.6%	51.0%	66.7%	62.7%	90.0%
	4	20.0%	27.0%	30.0%	8.0%	18.0%	27.0%	16.0%	0.0%	13.0%
	5	8.0%	16.0%	67.6%	81.0%	38.0%	29.4%	2.0%	49.0%	74.3%
	Average	**36.8%**	**22.5%**	**70.3%**	**26.2%**	**35.3%**	**30.6%**	**38.0%**	**39.5%**	**42.6%**

3.2 Health and Vigor

The average overall health and vigor of the mitigation plants increased from 2.9 in Year 8 (fair to good) to 3.2 in Year 10 (good) (Table 4). Excluding species that have all died (*i.e.*, species with average health and vigor ratings of 0.0), the average overall health and vigor rating for each species ranged from a low of 2.2 (fair) for red-flowering currant (*Ribes sanguineum*) to 4.0 (excellent) for western virgin's bower (*Clematis ligusticifolia*), brown dogwood (*Cornus glabrata*), western dogwood (*C. sericea*), twinberry honeysuckle (*Lonicera hispidula*), and California sycamore (*Platanus racemosa*).

Table 4. Average Health and Vigor in Years 1-6, 8, and 10

Scientific Name	Common Name	Average Overall Health and Vigor Score							
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-8	Yr-10
Acer macrophyllum	big-leaf maple	3.7	3.8	3.7	3.8	3.7	0.0	0.0	N/D
Aesculus californica	California buckeye	N/D	N/D	N/D	N/D	N/D	N/D	3.8	N/D
Alnus rubra	red alder	3.8	3.9	4.0	4.0	3.8	0.0	0.0	N/D
Baccharis pilularis	coyote brush	N/D	N/D	N/D	N/D	N/D	4.0	3.6	2.8
Ceanothus thyrsiflorus	blue blossom	3.7	3.8	3.2	3.0	4.0	2.5	1.1	2.3
Cercis occidentalis	western red bud	N/D	N/D	N/D	N/D	N/D	3.7	3.7	N/D
Clematis ligusticifolia	western virgin's bower	N/D	N/D	N/D	N/D	N/D	4.0	4.0	3.3
Cornus glabrata	brown dogwood	3.5	3.9	4.0	3.8	3.9	3.3	4.0	3.7
Cornus sericea	western dogwood	3.3	3.7	4.0	3.5	4.0	4.0	4.0	3.7
Frangula californica	coffeeberry	3.9	3.9	3.6	3.8	3.5	3.7	3.0	3.0
Heteromeles arbutifolia	toyon	3.7	3.9	4.0	4.0	4.0	3.8	3.8	3.3
Lonicera hispidula	twinberry honeysuckle	N/D	N/D	N/D	N/D	N/D	N/D	N/D	4.0
Platanus racemosa	California sycamore	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0

Scientific Name	**Common Name**	**Average Overall Health and Vigor Score**							
		Yr-1	**Yr-2**	**Yr-3**	**Yr-4**	**Yr-5**	**Yr-6**	**Yr-8**	**Yr-10**
Prunus ilicifolia	holly-leaf cherry	3.0	3.5	3.5	3.8	4.0	3.4	3.7	N/D
Quercus agrifolia	coast live oak	4.0	4.0	3.9	4.0	4.0	4.0	4.0	3.3
Quercus lobata	valley oak	4.0	4.0	4.0	4.0	4.0	4.0	4.0	N/D
Ribes aureum	golden currant	2.9	3.4	3.6	3.4	3.2	3.1	3.0	N/D
Ribes sanguineum	red flowering currant	2.2	3.2	3.5	3.6	3.3	0.0	0.0	2.2
Rosa californica	California rose	N/D	N/D	N/D	N/D	N/D	3.7	4.0	2.4
Rosa gymnocarpa	wood rose	N/D	N/D	N/D	N/D	N/D	0.0	0.0	N/D
Rubus ursinus	California blackberry	N/D	N/D	N/D	N/D	N/D	4.0	4.0	3.9
Salix gooddingii	Goodding's willow	N/D	N/D	N/D	N/D	N/D	1.4	1.7	2.4
Salix laevigata	red willow	N/D	N/D	N/D	N/D	N/D	1.9	3.6	3.3
Salix lasiolepis	arroyo willow	N/D	N/D	N/D	N/D	N/D	3.7	3.4	3.2
***Salix* spp.**	**all willows combined**	**3.6**	**4.0**	**3.5**	**3.9**	**3.8**	**2.1**	**2.8**	**3.0**
Sambucus nigra ssp. *caerulea*	blue elderberry	N/D	N/D	N/D	N/D	N/D	3.3	3.8	N/D
Sequoia sempervirens	redwood	N/D	N/D	N/D	N/D	N/D	4.0	2.5	3.3
Symphoricarpos albus	snowberry	N/D	N/D	N/D	N/D	N/D	2.9	3.8	2.7
	Average	**3.5**	**3.8**	**3.8**	**3.8**	**3.8**	**2.9**	**2.9**	**3.2**

Note N/D = no data. Cells with N/D indicate that the species did not occur within the randomly located 20-ft radius plots in that year. Health and vigor data were lumped across willow species (*Salix* sp.) in Years 1-5 so no data is available for the individual willow species prior to Year 6. In Years 6 and 8, species which did not occur in any of the 20-ft radius plots were searched for throughout the site, so health and vigor could be assessed for all species. Species that were not located during this search were assumed to have experienced 100% mortality.

3.3 Natural Recruitment

Naturally recruited native woody plants were observed along the eight transects throughout the site (Table 5). There is no performance or final success criterion for natural recruitment; however, these observations of high levels of natural recruitment for multiple species indicate that the site is on a trajectory towards self-sustainability.

Table 5. Natural Recruitment in Years 6, 8, and 10

Scientific Name	Common Name	# of Individuals		
		Year-6	Year-8	Year-10
Artemisia douglasiana	mugwort	0	2	0
Baccharis pilularis	coyote brush	3	1	4
Carex barbarae	Santa Barbara sedge	0	0	many*
Ceanothus thrysiflorus	blue blossom	0	0	1
Cornus glabrata	brown dogwood	0	3	0
Cornus sericea	western dogwood	0	0	4
Cyperus eragrostis	tall flatsedge	0	0	many*
Heteromeles arbutifolia	toyon	5	4	8
Juncus balticus	wire rush	0	0	many*
Lonicera hispidula	twinberry honeysuckle	0	0	many*
Prunus ilicifolia	holly-leaf cherry	1	0	3
Quercus agrifolia	coast live oak	2	3	11
Ribes sanguineum	red-flowering currant	0	0	many*
Rosa californica	California rose	many*	many*	4
Rubus ursinus	California blackberry	many*	many*	many*
Sequoia sempervirens	redwood	1	0	0
Symphoricarpos albus	snowberry	many*	many*	many*
Toxicodendron diversilobum	poison oak	0	0	2
Vitis californica	California grape	many*	0	0

* Individuals of these species were too numerous to count.

3.4 Plant Pathogen Testing

Six of the 12 samples tested positive for the presence of pathogenic water molds (*Phytophthora* spp.). Three individual plants were dead at the time of sampling and the remaining 18 were living in various states of health. Table 6 summarizes the sampling results.

Table 6. Results of Plant Pathogen Testing

Sample #	Scientific Name	Common Name	Phytophthora Species Detected	Plant Health Notes
1	*Heteromeles arbutifolia*	toyon	*P. cactorum*	Low vigor
2*	*Heteromeles arbutifolia*	toyon	*P. cactorum*	Low vigor, water-stressed
3	*Artemisia douglasiana*	mugwort	none	Healthy
4	*Heteromeles arbutifolia*	toyon	*P. cactorum*	Low vigor
5	*Prunus ilicifolia*	holly-leaf cherry	*P. cactorum*	Low vigor, healthy tissue
6	*Frangula californica*	coffeeberry	none	Branch dieback, stunted leaves
7*	*Ceanothus thyrsiflorus*	blue blossom	*P. cactorum, P. multivora, P. nicotianae*	3 of 5 individuals sampled were dead, 2 declining health
8*	*Heteromeles arbutifolia, Lepechinia calycina, Rosa californica, Symphoricarpos albus*	toyon, pitcher sage, California rose, snowberry	none	Poor health, water-stressed
9	*Artemisia californica*	California sagebrush	none	Branch dieback, possible water-stress
10	*Baccharis pilularis*	coyote brush	none	Healthy
11	*Sambucus nigra* ssp. *caerulea*	blue elderberry	*Phytophthora* taxon raspberry	Healthy
12	*Prunus ilicifolia*	holly-leaf cherry	none	Some branch dieback

* Composite sample

There is no apparent spatial pattern to the location of infected plants, as they occur randomly throughout the mitigation site.

Results indicate that *Phytophthora* spp. are present at the mitigation site. It appears *Phytophthora* spp. infection could be having negative effects on some of the mitigation plants, though there were several plants that appeared unhealthy, but which tested negative for the presence of *Phytophthora* spp. This indicates that there may be other factors, such as drought stress, contributing to poor plant health. In consultation with Phytosphere Research, the SCVWD decided against remediating the site (*e.g.*, heat treating planting basins) in the short term to avoid disturbing the healthy vegetation at the site.

Blue blossom (*Ceanothus thrysiflorus*) plants appeared to be hit especially hard by the likely combination of plant pathogen and drought stresses. Most died, and were removed from the site during site maintenance activities conducted in 2017 and 2018. The space opened up by removing these large dead shrubs was colonized by natural recruits of several species, chiefly red-flowering currant and coyote brush.

The inconclusiveness of the plant pathogen test results with regard to overall plant health at the site suggested that other stresses including drought were also likely at play. This idea is borne out by the recovery of the site (as indicated by percent cover increases) after two good water years (winters of 2016-2017 and 2017-2018). Average overall health and vigor of the riparian vegetation was measured as good in Year 10 (i.e., $\geq$3). Tree, shrub, and ground cover were 70%, 31%, and 43%, respectively, and the mitigation site experienced abundant natural recruitment.

3.5 Photo-documentation

Photographs taken from the photo-documentation points are presented in Appendix A.

Section 4.0 Management Recommendations

There are no management recommendations for the Adobe Creek Upper Reach 5 Restoration Project.

4.1 Agency Actions

The SCVWD requests written verification from the resource agencies confirming the required compensatory mitigation is fulfilled based on demonstrated mitigation success and no further annual reporting is required. The Year 10 monitoring results and completion of past monitoring commitments show the Adobe Creek Upper Reach 5 mitigation requirements are met with creek channel, wetland, and riparian habitat successfully established. As required by the RWQCB Water Quality Certification, the project was added to Wetland Tracker, now EcoAtlas Project Tracker, and updated in July 2018 (see https://www.ecoatlas.org/regions/ecoregion/statewide/projects/1395).

With project construction completed in 2008, final post-construction channel conditions in Reach 5 of Adobe Creek were reported in Year 5 (SCVWD 2014). Wetland habitat monitoring was conducted in Years 2 through 5 and the final wetland success criteria were met in Year 5 (0.053 acres of wetland restored) with results submitted to the resource agencies (SCVWD 2013).

Approximately 0.76 acres of native riparian forest has successfully been established. There were 25 oak trees planted and 11 coast live oaks naturally recruited within the riparian mitigation site. In addition to oaks, more than 290 native riparian trees from eight different species were planted. Almost 530 native shrubs and vines, and over 170 creeping wildrye were also planted. Over 200 more native riparian plants were installed in 2010. Survival of the planted trees and shrubs was monitored Year 1 followed by measuring health and vigor, and percent cover per the MMP. Year 10 results for percent cover of native riparian tree, shrub, and ground cover, as well as plant health and vigor are shown above, and detailed in this report. The mitigation site experienced abundant natural recruitment of native flora.

Section 5.0 Literature Cited

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Bonham, C. D. 1989. Measurements for Terrestrial Vegetation. John Wiley & Sons, New York.

EDAW. 2007. Adobe Creek, Upper Reach 5, Los Altos and Los Altos Hills, Santa Clara County, California Riparian Mitigation Monitoring Plan. Dated September 28, 2007.

[SCVWD] Santa Clara Valley Water District. 1999. Adobe Creek Watershed Planning Study El Camino Real to Upstream Moody Road consisting of the Engineer's Report and Final Environmental Impact Report. Dated May 1999.

[SCVWD] Santa Clara Valley Water District. 2007. Adobe Creek Upper Reach 5 Restoration Project Final Supplemental Environmental Impact Report. Dated July 2007.

[SCVWD] Santa Clara Valley Water District. 2013. Adobe Creek, Upper Reach 5, Los Altos and Los Altos Hills, Santa Clara County, California, Year-5 (2013) Riparian Mitigation Monitoring. Dated November 6, 2013.

[SCVWD] Santa Clara Valley Water District Alert System. 2014. Santa Clara Valley Historical Precipitation Data. Available at http://www.valleywater.org/Services/Alert.aspx. Accessed December 10, 2014.

[SCVWD] Santa Clara Valley Water District. 2014. Adobe Creek Upper Reach 5 Erosion Control Project 2014 Annual Monitoring Report. Dated December 29, 2014.

Appendix A. Photo-documentation September 6, 2018 (Year 10)

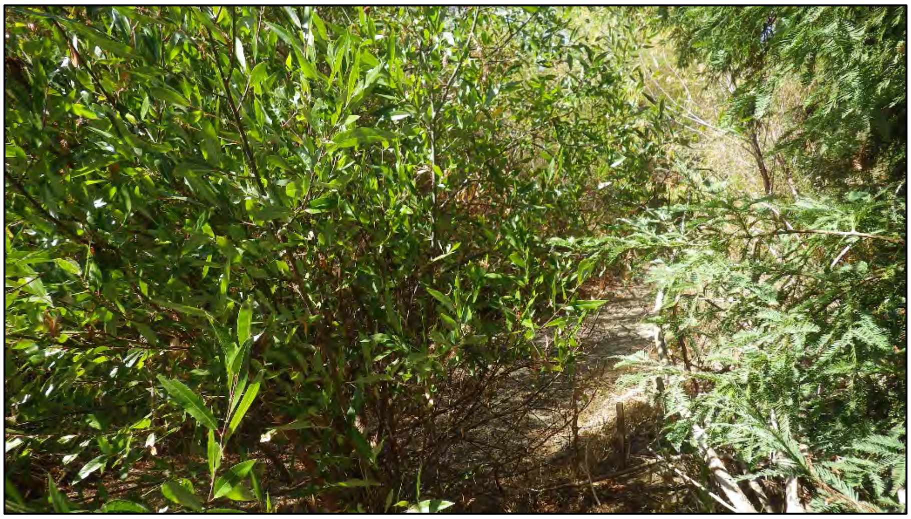

Photo-point 1, from north bank looking downstream towards south bank

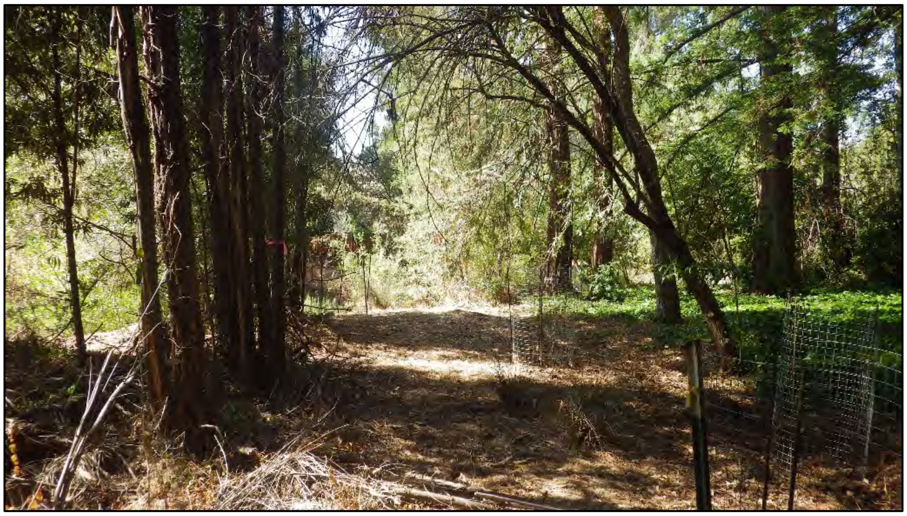

Photo-point 2, from outer curve of oxbow looking downstream

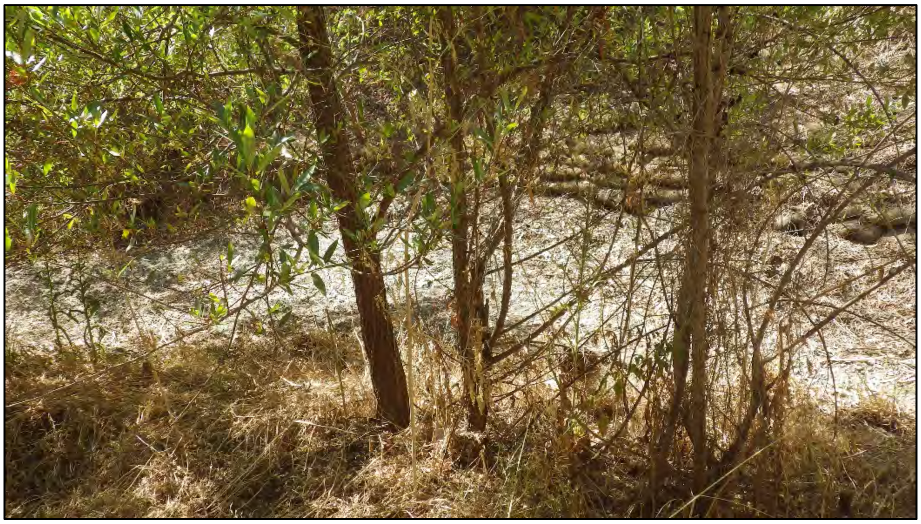

Photo-point 3, from north bank downstream of oxbow looking towards south bank

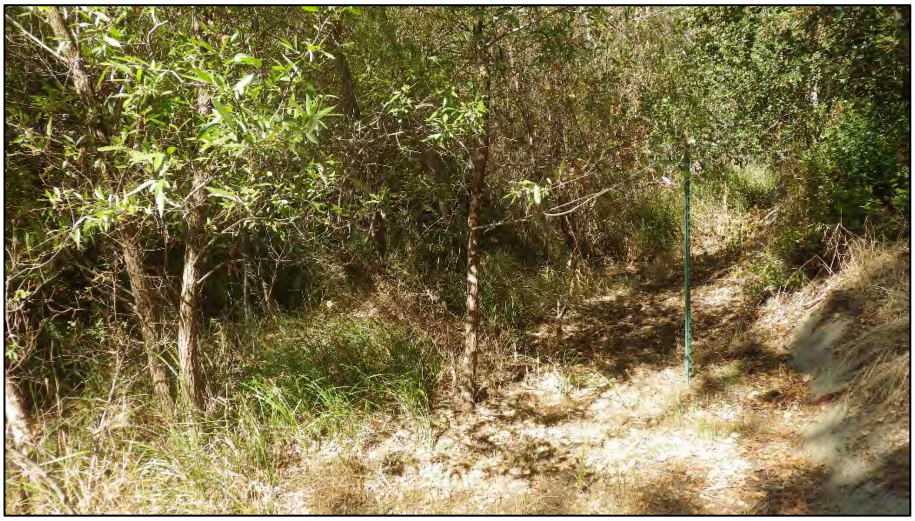

Photo-point 4, from north bank looking downstream towards south bank

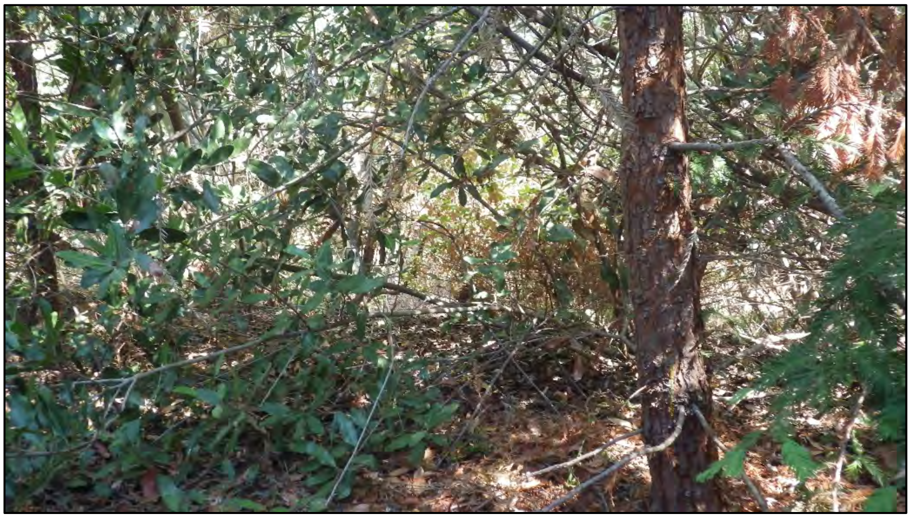

Photo-point 5, from south bank looking downstream toward end of project area

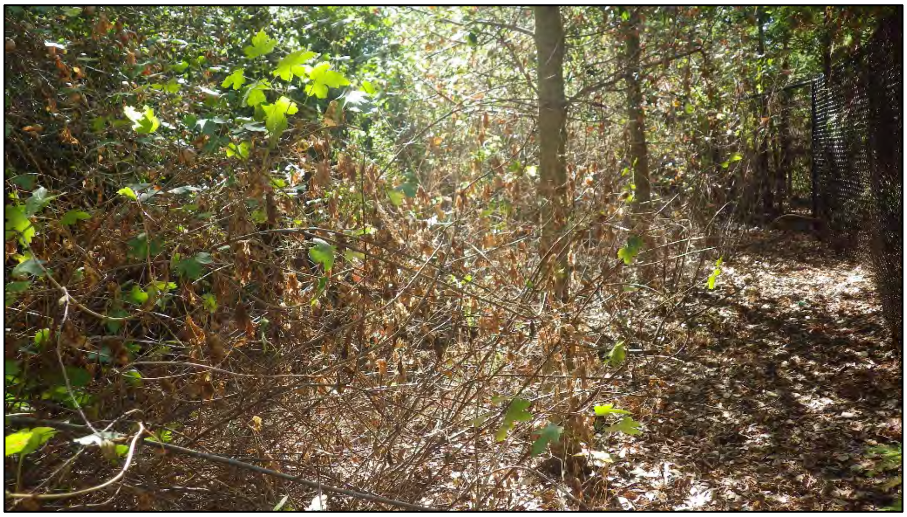

Photo-point 6, from south bank looking downstream

Appendix A. Photo-documentation September 6, 2018 (Year 10)

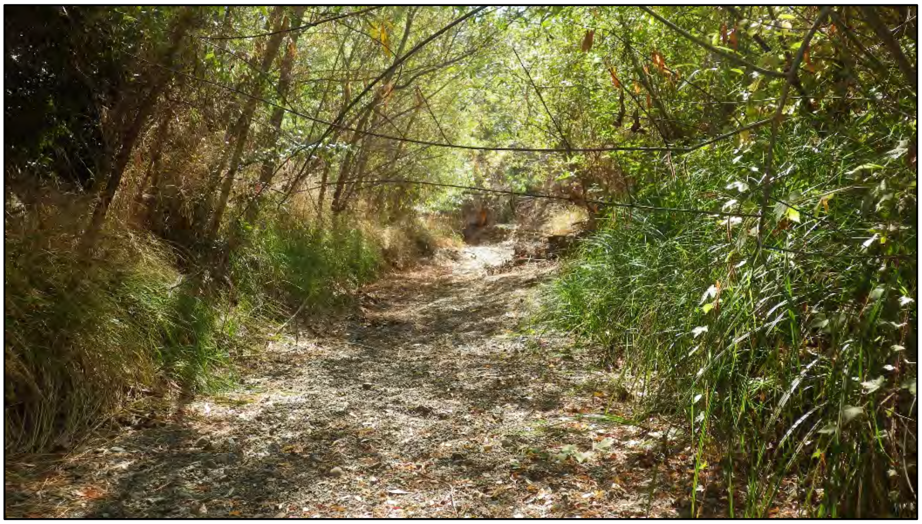

Photo-point 7, from south bank looking upstream at curve of creek

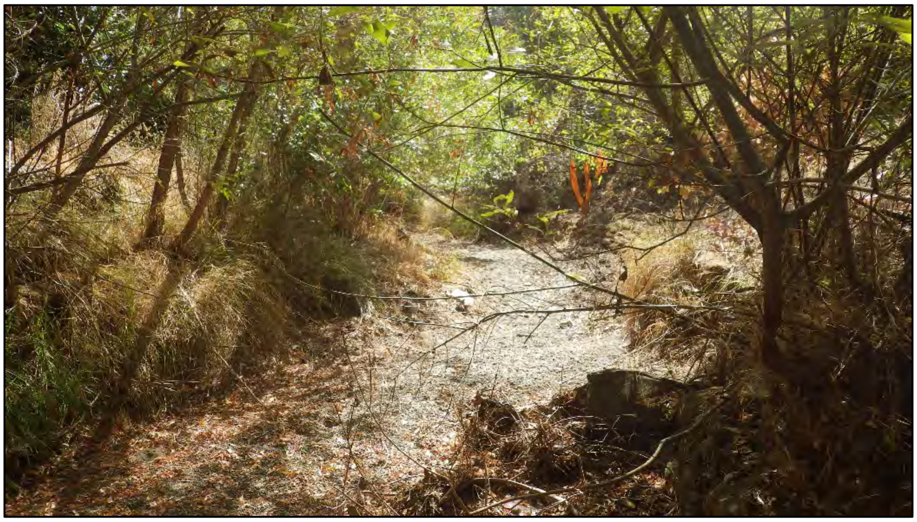

Photo-point 8, from south bank looking upstream

Appendix A. Photo-documentation September 6, 2018 (Year 10)

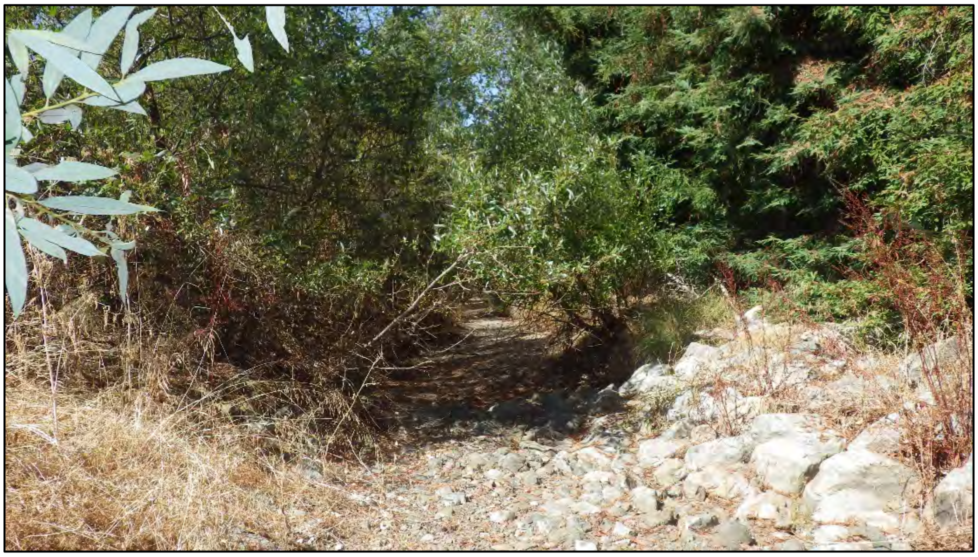

Photo-point 9, from north bank looking downstream